TROY TECHNICAL

ALL-SOLID-STATE BATTERIES

WEEKLY REPORT

October 24 - October 30, 2026 | Issue 2026-W43

Interface stability, manufacturability, safety and automotive qualification

11	10
ANALYZED ARTICLES	PRIORITY THEMES

Issued 2026-10-30 | English edition | fixed approved cover artwork



All-Solid-State Batteries: the boundary moved from isolated claims to qualification evidence

11 English articles were reviewed independently from the Japanese edition. Ten themes are retained for management decisions.

SIGNAL 01 | ELECTROLYTE

XPENG Solid-State Battery: IRON Humanoid Robot Specs and Roadmap

XPENG has commenced small-scale production of a dedicated solid-state battery for its IRON humanoid robot, offering 30% more capacity and 30% less weight than conventional liquid lithium batteries.

SIGNAL 02 | ELECTRODE INTERFACE

BattMan Accelerator: DOE's roadmap for SI-driven battery production

The Department of Energy has launched the Battery Manufacturing Accelerator (BattMan) to transition energy storage innovations from labs to US factories.

SIGNAL 03 | CELL PROCESS

Greater Bay Technology: All-solid-state cell production and specs

Greater Bay Technology (GBT) has commenced series production of all-solid-state battery cells using 1 GWh of converted lithium-ion capacity at its Nansha, Guangzhou plant.

SIGNAL 04 | VALIDATION

CATL Solid-State Batteries: 20 Ah Cell Progress and 2030 Roadmap

CATL has advanced its all-solid-state battery development to 20 Ah cells with a target energy density of 500 Wh/kg. The company plans to begin small-scale production in 2027, scaling to mass production by 2030.

DECISION

Focus this week's management attention on interface stability, manufacturability, safety and automotive qualification. Move only when the linked evidence can be reproduced under your own operating conditions.

THREE MANAGEMENT MOVES

1. Buyers: compare cell evidence under practical loading, pressure, temperature and cycle conditions.
2. Suppliers: show powder, interface and process consistency together with scale and cost.
3. Executives: track loading, pressure, interface resistance, yield, safety, capacity and timing.

EVIDENCE DISCIPLINE

FACT states what the collected English source reports. BUSINESS READ and ACTION are editorial interpretations. UNKNOWN lists information that the source file does not establish. A linked article is not treated as independent confirmation of every claim.

Five numbers or evidence anchors that require conditions

30%
A11

SOURCE-BOUND CONDITION
XPENG has commenced small-scale production of a dedicated solid-state battery for its IRON humanoid robot, offering 30% more capacity and 30% less weight than conventional liquid lithium batteries.

40%
A08

SOURCE-BOUND CONDITION
By implementing "Super Intelligence" (SI) and autonomous pilot lines, the consortium aims to reduce electrode manufacturing scrap from 40% to less than 5%.

1 GW
A05

SOURCE-BOUND CONDITION
Greater Bay Technology (GBT) has commenced series production of all-solid-state battery cells using 1 GWh of converted lithium-ion capacity at its Nansha, Guangzhou plant.

500 W
A04

SOURCE-BOUND CONDITION
CATL has advanced its all-solid-state battery development to 20 Ah cells with a target energy density of 500 Wh/kg.

467 W
A03

SOURCE-BOUND CONDITION
Researchers at HKUST have developed a dynamic integrated interface engineering strategy for anode-free lithium metal batteries, achieving a specific energy of 467 Wh kg -1 in pouch cells.

HOW TO USE THESE NUMBERS
Each value is shown with the condition stated in the collected English article. Do not compare values across different test methods, device sizes, operating temperatures or commercial stages without normalizing those conditions.

Where the value chain moved

Each stage combines one leading theme and one supporting theme. The report treats handoffs as evidence transfers, not decorative arrows.

1

Electrolyte

P01/P06

XPENG has commenced small-scale production of a dedicated solid-state battery for its IRON humanoid robot, offering 30% more.

2

Electrode interface

P02/P07

The Department of Energy has launched the Battery Manufacturing Accelerator (BattMan) to transition energy storage.

3

Cell process

P03/P08

Greater Bay Technology (GBT) has commenced series production of all-solid-state battery cells using 1 GWh of converted.

4

Validation

P04/P09

CATL has advanced its all-solid-state battery development to 20 Ah cells with a target energy density of 500 Wh/kg.

5

Vehicle deployment

P05/P10

Researchers at HKUST have developed a dynamic integrated interface engineering strategy for anode-free lithium metal.

EVIDENCE REQUIRED AT EACH HANDOFF

Electrolyte to Electrode interface	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.
Electrode interface to Cell process	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.
Cell process to Validation	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.
Validation to Vehicle deployment	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.

COMMON CONTROL POINT

No theme moves to a commercial commitment until a named owner has reproduced the relevant evidence and documented loading, pressure, interface resistance, yield, safety, capacity and timing.

Priority map: maturity and next decision locus



P01	XPENG Solid-State Battery: IRON Humanoid Robot Specs and Roadmap Business / rules | cue: capacity
P02	BattMan Accelerator: DOE's roadmap for SI-driven battery production Business / rules | cue: consortium
P03	Greater Bay Technology: All-solid-state cell production and specs Business / rules | cue: capacity
P04	CATL Solid-State Batteries: 20 Ah Cell Progress and 2030 Roadmap Business / rules | cue: fid
P05	HKUST Lithium Metal Batteries: Dynamic Interface Engineering Specs Business / rules | cue: capacity
P06	Solid-state batteries: KRICT's transfer-printing method for 15µm films Business / rules | cue: capacity
P07	Svolt Dragon Armor: 100-kWh Semi-Solid Battery Specs and Timeline System / adoption | cue: mass production
P08	Dongfeng and Chery: Solid-State Battery Roadmaps and 2027 Timelines System / adoption | cue: adoption
P09	PLAP Electrolyte: Prelithiated Polymer-Ceramic Specs for SSBs Tech / process | cue: no system/business cue
P10	Fluorinated Poly(ionic liquid) Electrolytes: 515 Wh kg-1 Solid-State Battery System / adoption | cue: system

REPRODUCIBLE POSITIONING RULE

Horizontal position uses five discrete stages: Research, Prototype, Joint evaluation, Product adoption and Scale. The vertical bands classify the next decision locus: Tech / process, System / adoption, or Business / rules (including supply systems). Article-title cues take precedence; the overview is used only when the title is silent. These are categories, not impact ranks. Bubble diameter reflects the editorial score.

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P01 XPENG Solid-State Battery: IRON Humanoid Robot Specs and Roadmap

A11 | Electrolyte | Scale-up

Date not stated

FACT

XPENG has commenced small-scale production of a dedicated solid-state battery for its IRON humanoid robot, offering 30% more capacity and 30% less weight than conventional liquid lithium batteries. This development supports a production timeline targeting mass production by the end of 2026 and commercial deployment in 2027.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P01.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 21/25 | MATURITY 5/5 | DECISION LOCUS: BUSINESS / RULES

P02 BattMan Accelerator: DOE's roadmap for SI-driven battery production

A08 | Electrode interface | Product adoption

Date not stated

FACT

The Department of Energy has launched the Battery Manufacturing Accelerator (BattMan) to transition energy storage innovations from labs to US factories. By implementing "Super Intelligence" (SI) and autonomous pilot lines, the consortium aims to reduce electrode manufacturing scrap from 40% to less than 5%.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P02.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 21/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P03 Greater Bay Technology: All-solid-state cell production and specs

A05 | Cell process | Product adoption

Date not stated

FACT

Greater Bay Technology (GBT) has commenced series production of all-solid-state battery cells using 1 GWh of converted lithium-ion capacity at its Nansha, Guangzhou plant. The cells meet the new Chinese GB/T 48093.1-2026 standard for solid-state batteries and support specific energy from 260 to 480 Wh/kg. This approach demonstrates a viable path for existing gigafactories to transition to solid-state production without building new lines from scratch.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P03.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 21/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

P04 CATL Solid-State Batteries: 20 Ah Cell Progress and 2030 Roadmap

A04 | Validation | Scale-up

Date not stated

FACT

CATL has advanced its all-solid-state battery development to 20 Ah cells with a target energy density of 500 Wh/kg. The company plans to begin small-scale production in 2027, scaling to mass production by 2030. This development is part of a broader industry race involving Toyota, Samsung SDI, and BYD to commercialize sulfide-based electrolytes.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P04.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 21/25 | MATURITY 5/5 | DECISION LOCUS: BUSINESS / RULES

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P05 HKUST Lithium Metal Batteries: Dynamic Interface Engineering Specs

A03 | Vehicle deployment | Product adoption

Date not stated

FACT

Researchers at HKUST have developed a dynamic integrated interface engineering strategy for anode-free lithium metal batteries, achieving a specific energy of 467 Wh kg -1 in pouch cells. The system utilizes an AMI additive to create a quasi-solid-state SEI, enabling a full coin cell to retain 90% capacity after 200 cycles. This approach addresses dendrite growth and stability issues to enable lighter, longer-lasting energy storage.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P05.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 20/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

P06 Solid-state batteries: KRICT's transfer-printing method for 15µm films

A02 | Electrolyte | Product adoption

Date not stated

FACT

Researchers at the Korea Research Institute of Chemical Technology (KRICT) have developed a transfer-printing technique to produce uniform 15-micrometer solid electrolyte films. This method significantly improves capacity retention and thermal stability compared to direct-coating techniques, addressing a major manufacturing hurdle for all-solid-state batteries.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P06.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 20/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P07 Svolt Dragon Armor: 100-kWh Semi-Solid Battery Specs and Timeline

A10 | Electrode interface | Scale-up

Date not stated

FACT

Svolt has commenced mass production of its 100-kWh " Dragon Armor" semi-solid battery packs in Changzhou, China. The system supports 6C fast charging to recover 311 miles of range in 12 minutes, positioning semi-solid technology as a permanent EV option rather than a temporary bridge to all-solid-state cells.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P07.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 20/25 | MATURITY 5/5 | DECISION LOCUS: SYSTEM / ADOPTION

P08 Dongfeng and Chery: Solid-State Battery Roadmaps and 2027 Timelines

A07 | Cell process | Product adoption

Date not stated

FACT

Dongfeng Motor and Chery Automobile have disclosed technical progress on semi-solid and all-solid-state batteries, with both targeting 2027 for key production or validation milestones. Dongfeng is preparing for mass adoption of 350Wh/kg cells, while Chery has unveiled a 400Wh/kg cell and plans a pilot line for 2027.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P08.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 20/25 | MATURITY 4/5 | DECISION LOCUS: SYSTEM / ADOPTION

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P09 PLAP Electrolyte: Prelithiated Polymer-Ceramic Specs for SSBs

A01 | Validation | Pilot

Date not stated

FACT

Researchers have developed a prelithiated polyurethane polymer-ceramic composite electrolyte (PLAP) achieving a room-temperature ionic conductivity of 3.8 × 10-4 S/cm. The material enables sustained lithium plating and stripping for 750 hours at 10 mA/cm2, addressing the critical trade-off between mechanical strength and ion transport in solid-state batteries.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P09.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 19/25 | MATURITY 2/5 | DECISION LOCUS: TECH / PROCESS

P10 Fluorinated Poly(ionic liquid) Electrolytes: 515 Wh kg-1 Solid-State Battery

A09 | Vehicle deployment | Pilot

Date not stated

FACT

Researchers have developed a fluorinated poly(ionic liquid) (PIL) electrolyte that enables a solid-state lithium metal battery with an energy density of 515 Wh kg-1. By utilizing an ionic-ligand-assisted transport framework, the system achieves high ionic conductivity and enhanced thermal safety compared to liquid electrolytes.

WHY IT MATTERS

The decision relevance is interface stability, manufacturability, safety and automotive qualification. The signal should be tested at the application and operating-system level, not accepted from a headline alone.

BUSINESS READ

For operating companies, compare the reported change with current qualification, sourcing and product-roadmap assumptions. For suppliers, show powder, interface and process consistency together with scale and cost.

ACTION

Within 30 days, compare cell evidence under practical loading, pressure, temperature and cycle conditions; record the evidence and owner against P10.

UNKNOWN

Still unproven or incompletely stated: loading, pressure, interface resistance, yield, safety, capacity and timing.

EDITORIAL SCORE 19/25 | MATURITY 2/5 | DECISION LOCUS: SYSTEM / ADOPTION

Playbook and 0-5 year roadmap

STAKEHOLDER	NOW | 0-30 DAYS	NEXT | 1-12 MONTHS	LATER | 1-5 YEARS
Operating companies	compare cell evidence under practical loading, pressure, temperature and cycle conditions	Run production-like qualification with explicit acceptance and stop criteria.	Build a portfolio and architecture that can absorb technology and supplier changes.
Materials, equipment and technology suppliers	show powder, interface and process consistency together with scale and cost	Create shared reliability, process-window and failure-analysis data with customers.	Standardize interfaces, traceability, lifecycle support and recovery services.
Trading, investment and legal teams	Map loading, pressure, interface resistance, yield, safety, capacity and timing.	Contract for capacity, quality, change notice, liability, alternatives and exit.	Diversify regional, technical and customer concentration risk.

ROADMAP

NOW | 0-30 DAYS
Evidence ledger
Owner: Strategy + quality
Deliverable: claim, source, condition, owner

NOW | 0-30 DAYS
Risk screen
Owner: Procurement + legal
Deliverable: unknowns, alternatives, stop

NEXT | 1-12 MONTHS
Joint qualification
Owner: R&D + supplier
Deliverable: process window and failure data

NEXT | 1-12 MONTHS
Commercial gate
Owner: Business + finance
Deliverable: unit economics and capacity

LATER | 1-5 YEARS
Platform strategy
Owner: Executive team
Deliverable: portfolio and interface roadmap

LATER | 1-5 YEARS
Service layer
Owner: Operations + channel
Deliverable: monitoring, maintenance and recovery

GO / NO-GO GATES

GATE	OWNER	REQUIRED EVIDENCE	NO-GO CONDITION
G1 Evidence	**Quality**	Source, test conditions and reproducibility	No traceable evidence
G2 Integration	**R&D**	Interface, process window and failure analysis	Cannot meet system conditions
G3 Commercial	**Business**	Capacity, total cost, contract and alternatives	Economics or supply cannot be supported
G4 Lifecycle	**Operations**	Monitoring, maintenance, change notice and exit	No accountable operating plan

ANALYZED ARTICLES | ITEMS 01-11

Every title and URL is displayed in full. URLs wrap without shortening and remain clickable. A verified-reference label means the translated HTML did not retain its original source URL.

ID	FULL ARTICLE TITLE	FULL SOURCE / VERIFIED REFERENCE URL - CLICKABLE
A01	PLAP Electrolyte: Prelithiated Polymer-Ceramic Specs for SSBs	https://bioengineer.org/prelithiated-polymer-ceramic-electrolyte-pushes-solid-state-batteries-toward-fast-charging/
A02	Solid-state batteries: KRICT's transfer-printing method for 15µm films	https://biz.heraldcorp.com/article/10914778
A03	HKUST Lithium Metal Batteries: Dynamic Interface Engineering Specs	https://www.miragenews.com/hkust-develops-dynamic-interface-for-lithium-1765509/
A04	CATL Solid-State Batteries: 20 Ah Cell Progress and 2030 Roadmap	https://electrek.co/2026/10/28/catl-pushes-ahead-20-ah-solid-state-ev-batteries-500-wh-kg/
A05	Greater Bay Technology: All-solid-state cell production and specs	https://chargedevs.com/newswire/greater-bay-technology-begins-all-solid-state-cell-production-on-a-converted-li-ion-line/
A06	NASA SPEARS Battery: All-Solid-State Prototype for -80°C Moon Ops	https://fabscene.com/new/news/nasa-spears-solid-state-battery-minus-80c/
A07	Dongfeng and Chery: Solid-State Battery Roadmaps and 2027 Timelines	https://www.energytrend.com/news/20261026-52368.html
A08	BattMan Accelerator: DOE's roadmap for SI-driven battery production	https://bioengineer.org/doe-led-battman-accelerator-aims-to-push-battery-innovation-from-lab-to-us-factory-floor/
A09	Fluorinated Poly(ionic liquid) Electrolytes: 515 Wh kg-1 Solid-State Battery	https://news.qq.com/rain/a/20261030A02VMM00
A10	Svolt Dragon Armor: 100-kWh Semi-Solid Battery Specs and Timeline	https://interestingengineering.com/energy/china-mass-production-100kwh-ev-battery
A11	XPENG Solid-State Battery: IRON Humanoid Robot Specs and Roadmap	https://autonews.gasgoo.com/articles/news/xpeng-starts-small-scale-production-of-solid-state-battery-for-humanoid-robots-2116105398767202304

SolidStateBattery — Selected Articles

Date: 2026-10-31

Articles: 11

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#04 CATL Solid-State Batteries: 20 Ah Cell Progress and 2030 Roadmap

#05 Greater Bay Technology: All-solid-state cell production and specs

#06 NASA SPEARS Battery: All-Solid-State Prototype for -80°C Moon Ops

#07 Dongfeng and Chery: Solid-State Battery Roadmaps and 2027 Timelines

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#09 Fluorinated Poly(ionic liquid) Electrolytes: 515 Wh kg^{-1} Solid-State Battery

#10 Svolt Dragon Armor: 100-kWh Semi-Solid Battery Specs and Timeline

#11 XPENG Solid-State Battery: IRON Humanoid Robot Specs and Roadmap

#01 PLAP Electrolyte: Prelithiated Polymer-Ceramic Specs for SSBs

Published October 29, 2026 BIOENGINEER.ORG China

OVERVIEW

Researchers have developed a prelithiated polyurethane polymer-ceramic composite electrolyte (PLAP) achieving a room-temperature ionic conductivity of 3.8×10^{-4} S/cm. The material enables sustained lithium plating and stripping for 750 hours at 10 mA/cm², addressing the critical trade-off between mechanical strength and ion transport in solid-state batteries.

IN DEPTH

Key Findings

The PLAP electrolyte, developed by Nanjing Tech University and partner institutions, demonstrates a room-temperature ionic conductivity of 3.8×10^{-4} S/cm. In symmetric cells, the material sustained lithium plating and stripping for 750 hours at a current density of 10 mA/cm². Furthermore, lithium iron phosphate full cells utilizing this electrolyte retained most of their capacity after 2,000 cycles.

Technical Details

The composite pairs a prelithiated polyurethane polymer with ceramic LAGP fillers (particles from 1 to 500 nm). To prevent "interfacial ion trapping"—where electronegative terminal hydroxyl groups bind lithium ions via Coulombic Li-O interactions—the team treated the sucrose-based polyether soft segment with lithium hydroxide. This "terminal prelithiation" converts hydroxyl groups into lithium alkoxide groups before polymerization.

- **Composition:** The optimized membrane contains 40 wt% LAGP, balancing a tensile strength of 5.47 MPa and an elongation at break of 192.4 percent.
- **Thermal Properties:** The glass transition temperature is approximately −43 °C, with decomposition beginning near 260 °C (based on a 5 percent weight-loss criterion).
- **Transport:** Conductivity increases to 1.01×10^{-3} S/cm at 80 °C, following Vogel-Tammann-Fulcher behavior with an apparent activation energy of 15.9 kJ/mol.

Background & Context

Solid-state batteries aim to replace flammable liquid electrolytes with solid conductors. However, inorganic ceramics like LAGP are brittle and suffer from grain-boundary resistance, while solid polymers typically exhibit poor room-temperature conductivity (below 10^{-5} S/cm). While blending the two is common, excessive ceramic filler often disrupts the polymer network and weakens mechanical integrity.

Significance & Outlook

By utilizing chemical modification rather than simple compositional changes, the PLAP electrolyte overcomes the interfacial resistance that plagued previous polyurethane-LAGP systems. Compared to an unmodified hydroxyl-terminated analogue—which achieved only 10^{-6} S/cm and showed severe polarization within 100 hours—the PLAP system provides a viable path toward fast-charging solid-state batteries by suppressing lithium dendrite propagation through its balanced mechanical and conductive properties.

Source: https://bioengineer.org/prelithiated-polymer-ceramic-electrolyte-pushes-solid-state-batteries-toward-fast-charging/

Collected: October 31, 2026 | Automated Research System (AI)

#02 Solid-state batteries: KRICT's transfer-printing method for 15µm films

Published October 26, 2026 The Herald Business South Korea

OVERVIEW

Researchers at the Korea Research Institute of Chemical Technology (KRICT) have developed a transfer-printing technique to produce uniform 15-micrometer solid electrolyte films. This method significantly improves capacity retention and thermal stability compared to direct-coating techniques, addressing a major manufacturing hurdle for all-solid-state batteries.

IN DEPTH

Key Findings

The Korea Research Institute of Chemical Technology has developed a "transfer-printing" process that enables the production of a uniform solid electrolyte film with an average thickness of 15 micrometers and a variation of approximately 1 micrometer across a 120 square centimeter area. Cells utilizing this method retained 83.6 percent of their initial capacity after 100 charge-discharge cycles, compared to only 36.1 percent for cells produced via conventional direct-coating methods.

Technical Details

The team utilized LLZTO, a garnet-type oxide solid electrolyte. Unlike conventional methods where liquid electrolytes are applied directly to electrodes—often causing seepage, electrode deformation, and uneven thickness—the transfer-printing process involves coating the electrolyte onto a separate substrate, drying it, and then pressing it onto the electrode using a roller. To optimize the material combination, researchers applied the Hansen Solubility Parameter (HSP) to ensure the electrolyte spreads evenly during coating and releases cleanly during transfer.

Performance metrics include:

- Lithium-ion conductivity: Approximately 50 percent higher than conventional polyethylene separators.
- Lithium-ion transference number: Approximately twice as high as the comparison group.
- Thermal stability: Pouch-type cells remained stable at 150 degrees Celsius for two hours and 30 minutes, whereas polyethylene separator-based cells suffered internal short circuits and voltage drops within 10 minutes.

Background & Context

All-solid-state batteries are targeted for electric vehicles and energy storage systems to reduce fire risks and increase energy density. However, commercialization has been hindered by the difficulty of producing thin, uniform films; conventional manufacturing typically required thicknesses of 70 to 120 micrometers to prevent tearing.

Significance & Outlook

The transfer-printing technique is expected to integrate with roll-to-roll continuous production to improve manufacturing efficiency and reduce defect rates in large-area applications. While pouch-type cells showed a capacity retention rate of 81.6 percent after 100 cycles, the researchers noted that further verification of production yield, manufacturing costs, and long-term cycle life is required before commercial deployment.

Source: https://biz.heraldcorp.com/article/10914778

Collected: October 31, 2026 | Automated Research System (AI)

#03 HKUST Lithium Metal Batteries: Dynamic Interface Engineering Specs

Published October 23, 2026 Mirage News China

OVERVIEW

Researchers at HKUST have developed a dynamic integrated interface engineering strategy for anode-free lithium metal batteries, achieving a specific energy of 467 Wh kg -1 in pouch cells. The system utilizes an AMI additive to create a quasi-solid-state SEI, enabling a full coin cell to retain 90% capacity after 200 cycles. This approach addresses dendrite growth and stability issues to enable lighter, longer-lasting energy storage.

IN DEPTH

Key Findings

A research team led by Prof. SHAO Minhua at The Hong Kong University of Science and Technology (HKUST) has demonstrated a dynamic integrated interface engineering strategy that significantly improves the stability and energy density of anode-free lithium metal batteries. A pouch cell implementing this strategy achieved a specific energy of 467 Wh kg -1, a figure comparable to conventional commercial batteries. Furthermore, a full coin cell utilizing this method retained 90% of its capacity after 200 cycles.

Technical Details

The team introduced an AMI additive consisting of silver ions paired with anions to overcome the lithiophobic nature of bare copper (Cu) current collectors. This additive performs several synergistic functions:

- **Lithiophilicity:** It improves the surface's affinity for lithium and prevents dendrite generation.
- **SEI Architecture:** The Ag-modified surface anchors anion-derived species, creating a Solid Electrolyte Interphase (SEI) featuring an organic-rich inner layer (OI) and an inorganic-rich outer layer (IO).
- **Polymerization:** Released anions trigger electrolyte polymerization, resulting in a quasi-solid OI-IO SEI gel.

This integrated process ensures fast lithium-ion transport and improves interfacial contact, making lithium plating and stripping highly reversible within a quasi-solid-state configuration.

Background & Context

Lithium metal is highly valued for its low reduction potential and high theoretical specific capacity. Anode-free cells, which replace the lithium metal anode with a bare copper current collector, maximize energy density and simplify manufacturing. However, these cells typically suffer from uneven lithium deposition and unstable naturally forming SEIs, which limit battery life and safety due to dendrite growth.

Significance & Outlook

The research, published in *Nature Communications* as "Highly stable quasi-solid-state initially-anode-free lithium metal batteries enabled by dynamic integrated interface engineering," provides a pathway toward next-generation batteries. By modifying the current collector and building a robust SEI in one integrated process, the strategy establishes a stronger foundation for developing lighter and more durable battery systems.

Source: https://www.miragenews.com/hkust-develops-dynamic-interface-for-lithium-1765509/

Collected: October 31, 2026 | Automated Research System (AI)

#04 CATL Solid-State Batteries: 20 Ah Cell Progress and 2030 Roadmap

Published October 28, 2026 Electrek USA

OVERVIEW

CATL has advanced its all-solid-state battery development to 20 Ah cells with a target energy density of 500 Wh/kg. The company plans to begin small-scale production in 2027, scaling to mass production by 2030. This development is part of a broader industry race involving Toyota, Samsung SDI, and BYD to commercialize sulfide-based electrolytes.

IN DEPTH

Key Findings

CATL has reached a development milestone by advancing its all-solid-state battery cells to 20 Ah. The company is targeting an energy density of 500 Wh/kg and expects to initiate small-scale production in 2027, with full mass production projected for 2030.

Technical Details

CATL utilizes a sulfide-based solid electrolyte system, selected for its high deformability and ionic conductivity. However, the company notes that maintaining stable contact between solid components remains a technical hurdle. To provide context on the maturity of the technology, CATL Chairman and CEO Robin Zeng stated in June that all-solid-state batteries have currently reached level four on a scale of one to nine.

Industry Context and Competition

Several other major players are pursuing similar timelines for all-solid-state commercialization:

- **Toyota:** Aims to launch the first all-solid-state EV in 2027 or 2028. Toyota claims a prototype capable of a 745 miles (1,200 km) range and charging in under 10 minutes, utilizing a "highly durable cathode material" developed with Sumitomo Metal Mining's powder synthesis technology.
- **Samsung SDI:** Targets mass production of its SolidStack batteries in the second half of 2027.
- **BYD:** Plans to launch its first solid-state vehicle in 2027. Its battery division, FinDreams, intends to produce sulfide-based all-solid-state batteries in limited batches in 2027, ramping up to mass production by 2030.

Significance and Outlook

While all-solid-state batteries are viewed as a "holy grail" for increasing range and charging speeds, they coexist with other chemistry advancements. CATL and BYD continue to develop lithium iron phosphate (LFP) and sodium-ion batteries to provide lower-cost options. For instance, BYD's second-generation Blade LFP batteries already achieve over 1,000 km (621 miles) of CLTC range. The transition to these new chemistries is expected to incrementally improve EV efficiency and performance across different market segments.

Source: https://electrek.co/2026/10/28/catl-pushes-ahead-20-ah-solid-state-ev-batteries-500-wh-kg/

Collected: October 31, 2026 | Automated Research System (AI)

#05 Greater Bay Technology: All-solid-state cell production and specs

Published October 26, 2026 Charged EVs USA

OVERVIEW

Greater Bay Technology (GBT) has commenced series production of all-solid-state battery cells using 1 GWh of converted lithium-ion capacity at its Nansha, Guangzhou plant. The cells meet the new Chinese GB/T 48093.1-2026 standard for solid-state batteries and support specific energy from 260 to 480 Wh/kg. This approach demonstrates a viable path for existing gigafactories to transition to solid-state production without building new lines from scratch.

IN DEPTH

Key Findings

Greater Bay Technology (GBT) has transitioned 1 GWh of existing lithium-ion production capacity to series production of all-solid-state battery cells in Nansha, Guangzhou. The company reports that its cells have passed all cell-level safety tests required by China's GB 38031-2025 standard, including a third-party nail penetration test on fully charged cells that resulted in no fire or explosion.

Technical Details

The GBT platform supports specific energy ranging from 260 to 480 Wh/kg across different generations. The first generation utilizes automotive-grade pouch formats and established electrode materials to facilitate vehicle qualification, while subsequent generations will incorporate lithium-metal anodes. To meet the GB/T 48093.1-2026 standard—which requires a cell to lose less than 0.5% of its mass when baked in a vacuum at 120° C for six hours—GBT's cells were verified by the National Power Battery Innovation Center.

The production process employs an organic-inorganic composite electrolyte introduced as a liquid precursor and solidified in place. This method allows GBT to use conventional lithium-ion equipment for electrode preparation, stacking, formation, and testing. The only significant modification was the rebuilding of the electrolyte-filling station to enable injection and curing within a dry, oxygen-free micro-environment.

Background & Context

GBT has established strategic cooperation agreements with Hubei Liming Lithium Technology (a battery-pack maker) and the Shenzhen Vertical Take-off and Landing Aircraft Innovation Center for eVTOL development. In Europe, the company has partnered with electric light commercial vehicle developer FLYNT.

Significance & Outlook

The conversion of the Nansha plant highlights a flexible manufacturing strategy; the remaining capacity of the 4 GWh plant can be converted based on orders, and the converted lines can switch back to lithium-ion production. According to founder and CTO Huang Xiangdong, the company moved from A-samples in April to series production in October, suggesting a rapid deployment timeline for existing facility upgrades.

Source: https://chargedevs.com/newswire/greater-bay-technology-begins-all-solid-state-cell-production-on-a-converted-li-ion-line/

#06 NASA SPEARS Battery: All-Solid-State Prototype for -80°C Moon Ops

Published October 24, 2026 FabScene USA

OVERVIEW

NASA has developed a prototype all-solid-state battery under the SPEARS project that remains operational at -80°C. By replacing liquid electrolytes with solid materials, the battery avoids freezing and evaporation in lunar environments, potentially reducing the mass of thermal management systems for moon missions.

IN DEPTH

Key Findings

NASA announced on October 14, 2026, that a small prototype cell developed under the SPEARS project successfully operated at temperatures as low as -80°C. While performance slightly decreased at this extreme, the cell remained functional. Furthermore, the battery showed no damage after being exposed to a temperature range between 100°C and -170°C.

Technical Details

The SPEARS battery replaces the liquid electrolytes found in standard lithium-ion batteries—which are prone to freezing at lunar night temperatures or evaporating in a vacuum—with solid materials based on ceramics or polymers. Testing was conducted by the Langley Research Center using "thermal vacuum tests" on coin-shaped prototype cells. The results showed the cells operated within a range of 80°C to -60°C, with continued (though reduced) operation at -80°C.

Although the battery does not function at -170°C, the solid electrolyte prevents the permanent damage associated with freezing. NASA notes that the battery only requires a small heater to reach operating temperature before use, rather than requiring constant heating.

Background & Context

The project is led by Donald Dornbusch at the Glenn Research Center, with Yi Lin leading the testing phase. SPEARS began in 2026 with funding from NASA's Research and Technology Mission Directorate, evolving from previous research on batteries for aircraft. Additionally, the Ames Research Center is developing the electronic equipment and substrates necessary to test these batteries in space.

Significance & Outlook

This technology is intended for use in lunar south pole exploration, where night temperatures can drop to -200°C. Targeted applications include:

- Small tools, such as drills, for use in shadowed craters.
- Lunar rovers.

- Emergency power sources for astronauts.

According to Lin, the battery's energy capacity, output, and durability can be adjusted by changing the electrode materials. NASA intends to focus on technical development in the initial stage before potentially collaborating with private companies.

Source: https://fabscene.com/new/news/nasa-spears-solid-state-battery-minus-80c/

Collected: October 31, 2026 | Automated Research System (AI)

#07 Dongfeng and Chery: Solid-State Battery Roadmaps and 2027 Timelines

Published October 26, 2026 EnergyTrend China

OVERVIEW

Dongfeng Motor and Chery Automobile have disclosed technical progress on semi-solid and all-solid-state batteries, with both targeting 2027 for key production or validation milestones. Dongfeng is preparing for mass adoption of 350Wh/kg cells, while Chery has unveiled a 400Wh/kg cell and plans a pilot line for 2027.

IN DEPTH

Key Findings

Dongfeng Motor and Chery Automobile are advancing their solid-state battery R&D, focusing on energy density improvements and vehicle-level integration. Dongfeng plans the mass adoption of its fast-charging semi-solid battery in 2027 and aims to deliver 50,000 vehicles equipped with in-house solid-state batteries by that year. Chery has introduced the Rhinoceros S solid-state battery cell with an energy density of 400Wh/kg and expects its pilot production line to be operational in 2027.

Technical Details

Dongfeng's battery portfolio is tiered into 240Wh/kg, 350Wh/kg, 400Wh/kg, and 500Wh/kg variants. Its 350Wh/kg semi-solid battery has completed cold-region testing in Mohe, Heilongjiang, and is targeted for vehicle installation in Q4 2026. The 400Wh/kg all-solid-state battery is currently in the prototyping phase and undergoing vehicle integration validation.

Chery's Rhinoceros Battery development follows three routes: hybrid, pure electric, and solid-state. The 400Wh/kg cell utilizes a sulfide solid electrolyte with a high-nickel ternary cathode, while a 600Wh/kg cell employs an in-situ polymerized solid electrolyte and lithium-rich manganese-based cathode. The 400Wh/kg cell operates between -40°C and 100°C and has passed a 200°C hot-box test. Chery targets vehicle integration for semi-solid batteries in Q4 2026 and on-board validation for all-solid-state batteries in 2027.

Background & Context

Dongfeng has established an end-to-end in-house platform for R&D and pilot production, supported by the Hubei Solid-State Battery Industry Technology Innovation Consortium formed in May with 18 partner entities. Chery is currently addressing challenges in battery pack systems and DMS management. To support fabrication, Chery issued procurement notices in October for equipment including Raman spectrometers, ICP-OES systems, ultrasonic spot welders, and roll presses.

Significance & Outlook

The transition from laboratory development to large-scale commercialization remains a significant challenge. While semi-solid batteries are nearing vehicle installation by late 2026, all-solid-state technology remains in the prototyping and validation stages, with pilot production lines slated for 2027.

Source: https://www.energytrend.com/news/20261026-52368.html

Collected: October 31, 2026 | Automated Research System (AI)

#08 BattMan Accelerator: DOE's roadmap for SI-driven battery production

Published October 29, 2026 BIOENGINEER.ORG USA

OVERVIEW

The Department of Energy has launched the Battery Manufacturing Accelerator (BattMan) to transition energy storage innovations from labs to US factories. By implementing "Super Intelligence" (SI) and autonomous pilot lines, the consortium aims to reduce electrode manufacturing scrap from 40% to less than 5%.

IN DEPTH

Key Findings

The Battery Manufacturing Accelerator (BattMan) is a national consortium led by the Pacific Northwest National Laboratory and Oak Ridge National Laboratory (ORNL) designed to accelerate the commercialization of advanced battery chemistries. The primary objective is to eliminate critical barriers in the production pipeline to lower manufacturing costs and shorten development timelines for applications in electric mobility, data centers, the electric grid, and national security.

Technical Details

The technical framework centers on "Super Intelligence" (SI)-driven smart manufacturing. Unlike traditional fixed processes, BattMan embeds real-time monitoring and automated feedback directly into production lines. Specifically, electrode manufacturing machines will utilize visual, temperature, and pressure sensors linked to an SI-enhanced analysis platform to correct errors during operation.

A major target is the reduction of material waste. Currently, up to 40% of materials, including lithium and cobalt, can become scrap during electrode manufacturing; BattMan aims to reduce this figure to less than 5%. To achieve this, the consortium is developing:

- **Autonomous Pilot Lines:** Integrating sensing and intelligent control to prove manufacturing readiness and reduce variability.
- **Digital Twins:** Virtual replicas linked to physical systems to model performance improvements safely.
- **Smart Test Beds:** Vertically integrated systems at ORNL's Battery Manufacturing Facility for real-time data analysis and autonomous parameter adjustment.

Background & Context

The consortium includes Argonne National Laboratory, the National Laboratory of the Rockies, and several universities, including the University of Washington, Binghamton University, the University of Alabama, Arizona State University, and the University of Michigan-Dearborn. The effort is supported by the DOE’s Advanced Materials and Manufacturing Technologies Office within the Office of Critical Minerals and Energy.

Significance & Outlook

The SI-based platform is designed for adaptability across various technologies, including conventional lithium-ion, solid-state, and flow batteries. Beyond process efficiency, BattMan seeks to strengthen the US supply chain by advancing battery materials derived from abundant domestic elements, thereby reducing reliance on geographically concentrated raw materials.

Source: https://bioengineer.org/doe-led-battman-accelerator-aims-to-push-battery-innovation-from-lab-to-us-factory-floor/

Collected: October 31, 2026 | Automated Research System (AI)

#09 Fluorinated Poly(ionic liquid) Electrolytes: 515 Wh kg^{-1} Solid-State Battery

Published October 30, 2026 腾讯网 China

OVERVIEW

Researchers have developed a fluorinated poly(ionic liquid) (PIL) electrolyte that enables a solid-state lithium metal battery with an energy density of 515 Wh kg^{-1}. By utilizing an ionic-ligand-assisted transport framework, the system achieves high ionic conductivity and enhanced thermal safety compared to liquid electrolytes.

IN DEPTH

Key Findings

A collaborative study by the Tianmu Lake Advanced Energy Storage Technology Research Institute and Suzhou Laboratory has produced a solid-state lithium metal battery achieving an energy density of 515 Wh kg^{-1}. This was realized using a multi-layer pouch cell featuring a 50 μm ultra-thin lithium anode and a high-loading NCM90 cathode (approximately 56 mg cm^{-2}). The battery demonstrated stability over 30 cycles at 0.05 C within a voltage range of 2.8 to 4.3 V.

Technical Details

The researchers synthesized a copolymer of 2,2,3,3,4,4,5,5-perfluoropentyl acrylate and N-methyl-N-allylpyrrolidinium bis(fluorosulfonyl)imide. This design creates an "ionic-ligand-assisted transport" framework where PIL cation groups anchor FSI^- anions, facilitating Li^+ "hopping" transport. Key technical specifications include:

- **Ionic Conductivity:** 0.38 mS cm^{-1} at 30°C.
- **Li^+ Transference Number:** 0.77.
- **Electrochemical Window:** Extended to 4.94 V.
- **Cycle Life:** Li||NCM90 cells maintained approximately 81.0% capacity after 600 cycles at 4.3 V and 83.1% after 200 cycles at 4.5 V.
- **Interface Stability:** Li||Cu cells showed an average Coulombic efficiency of 99.1% over 400 cycles.

Analysis via SEM, XPS, and TOF-SIMS revealed that the electrolyte promotes an inorganic-rich SEI on the lithium anode and a thin, uniform CEI (reduced from 26 nm to 7 nm) on the NCM90 cathode.

Safety and Performance

The fluorinated PIL framework provides significant safety improvements. In nail penetration tests, the pouch cell showed no significant temperature rise and remained structurally intact, whereas the liquid electrolyte control burned with temperatures exceeding 1200°C. ARC tests showed the self-heating start temperature increased from 91.1°C to 119.5°C, and the thermal runaway threshold rose from 117.5°C to 208.0°C.

Significance

This research decouples Li^+ transport from the slow large-scale movement of the polymer matrix. By combining high cathode loading, a low N/P ratio (approximately 0.85), and low electrolyte mass loading (approximately 1.5 g Ah^{-1}), the study provides a material strategy for high-energy-density, high-safety solid-state batteries.

Source: https://news.qq.com/rain/a/20261030A02VMM00

Collected: October 31, 2026 | Automated Research System (AI)

#10 Svolt Dragon Armor: 100-kWh Semi-Solid Battery Specs and Timeline

Published October 27, 2026 Interesting Engineering China

OVERVIEW

Svolt has commenced mass production of its 100-kWh "Dragon Armor" semi-solid battery packs in Changzhou, China. The system supports 6C fast charging to recover 311 miles of range in 12 minutes, positioning semi-solid technology as a permanent EV option rather than a temporary bridge to all-solid-state cells.

IN DEPTH

Key Findings

Svolt Energy has rolled its first mass-produced 100-kWh “Dragon Armor” semi-solid fast-charging battery packs off the assembly line in Changzhou, Jiangsu province. The company asserts that semi-solid batteries will remain a core, permanent option for electric vehicles for years to come, diverging from the industry view that such technology is merely a temporary fix before the arrival of fully solid-state batteries.

Technical Details

The battery pack is built on a 900-volt architecture and supports 6C fast charging, which Svolt claims can add 311 miles (500 kilometers) of range in 12 minutes. To manage the resulting thermal loads, the pack utilizes liquid cooling layered across both the top and bottom. Internally, a proprietary separator transfer-printing technology is used to stabilize ion transfer during rapid charging.

Safety and longevity specifications include:

- **Structural Protection:** Six layers of underbody armor providing three times the impact resistance required by China’s national safety standard.
- **Cycle Life:** Over 3,000 charges achieved via high-speed cell stacking, translating to a theoretical lifetime driving distance exceeding 0.6 million miles (1 million kilometers).
- **Energy Density:** First-generation packs deliver 300 Wh/kg, with a second-generation version targeting 360 Wh/kg.

Background and Context

Svolt currently holds 2.6 percent of the global EV battery market (ranking ninth) and 6.31 percent of China’s premium ternary battery segment (ranking fourth). While competitors like WeLion provide 150-kWh packs for NIO, those remain limited to high-end applications due to cost. Svolt is pushing semi-solid production now to achieve price parity with conventional liquid lithium-ion cells.

Significance and Outlook

The launch accelerates previous industry timelines that projected a 2027 rollout. While Svolt has not disclosed specific customer names or the size of the initial production batch, leadership confirmed that multiple automakers have secured nominations. The company expects 2026 to mark the start of widespread semi-solid battery adoption.

Source: https://interestingengineering.com/energy/china-mass-production-100kwh-ev-battery

Collected: October 31, 2026 | Automated Research System (AI)

#11 XPENG Solid-State Battery: IRON Humanoid Robot Specs and Roadmap

Published October 30, 2026 Gasgoo China

OVERVIEW

XPENG has commenced small-scale production of a dedicated solid-state battery for its IRON humanoid robot, offering 30% more capacity and 30% less weight than conventional liquid lithium batteries. This development supports a production timeline targeting mass production by the end of 2026 and commercial deployment in 2027.

IN DEPTH

Key Findings

XPENG has completed the small-scale production of a solid-state battery specifically engineered for its IRON humanoid robot. According to Vice President Gu Jie, who spoke at the China Society of Automotive Engineers (SAECCE) conference on October 28, the robot itself is currently in the final stages prior to formal mass production (SOP).

Technical Details

The dedicated solid-state battery provides significant improvements over conventional liquid lithium batteries in three primary areas:

- **Energy Density and Capacity:** The battery offers approximately 30% more capacity.
- **Weight Reduction:** The unit weighs about 30% less than traditional liquid alternatives.
- **Safety:** The design prevents thermal runaway and has successfully passed rigorous impact and nail penetration tests.

Background and Context

The robotics division is now XPENG's second-largest business unit after its new energy vehicle sector. To accelerate the production timeline, XPENG held its first supply chain partner conference on September 22, finalizing selections and audits for suppliers of AI chips, sensors, dexterous hands, and actuators.

This robotics initiative leverages XPENG's existing automotive battery expertise. In February 2026, the company reported that its automotive solid-state batteries achieved a pack volume utilization rate of 78%—a 23 percentage point increase over liquid packs—while reducing weight by 35%. Additionally, Chairman He Xiaopeng stated in September that XPENG has invested in three battery cell manufacturers and will bring battery production in-house starting in 2026.

Significance and Outlook

The IRON humanoid robot is scheduled to enter mass production by the end of 2026. XPENG plans to begin sales and deliveries in 2027, deploying the robots in commercial settings and global stores to perform product demonstrations and guidance services.

Source: https://autonews.gasgoo.com/articles/news/xpeng-starts-small-scale-production-of-solid-state-battery-for-humanoid-robots-2116105398767202304